Solving Optimal Control Problem Using Max-Min Ant System

Abstract

An improved ant colony algorithm for optimal control problems with box constrain on control functions is presented. The hypercube of the feasible controls as well as the time interval are initially discretized to approximate control problem into a discrete parameter selection problem. Then, the ant colony algorithm is applied to search for optimum parameters of approximated problem while a proper local search is also introduced to iteratively enhance the quality of solution. The results of numerical simulation on MATLAB environment illustrate the effectiveness of this method.